Quality Assurance, Error Reduction, and Patient Safety in Anatomic Pathology

Using LEAN to Improve Quality, Patient Safety and Workflow

Leo Serrano, FACHE, CLSup (NCA)
Avera McKennan Hospital
Sioux Falls, SD

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Disclosure

Presenter has no conflicts of interest in this presentation and endorses no vendor.
Expectations:

- Identify how process Improvement methods can lead to improved outcomes.

- Learn how the application of LEAN principles reduces opportunities for errors.

- See how automation and LEAN complement each other in histology.
Who Are We?
McKennon Hospital and University Health Avera Center

- 510 bed facility located in Sioux Falls, South Dakota
- More than 3,100 employees; 18,000 discharges; 265 employed physicians in 26 specialties and 73 mid-level practitioners located in 50 sites
- Member of Avera Health, a regional healthcare family of more than 100 healthcare facilities in the five state region of South Dakota, North Dakota, Minnesota, Iowa and Nebraska
Base Conditions
in Histology

(Where We Started)
Space and Product Flows

- Like most Histology Labs, space was added in a random fashion as it was needed and became available with little attention to flow.

- Specimen/Product flow did not follow the most efficient and effective route due to layout constraints.
Pre-Lean Histology
H & E Slides/Tech/Yr

- Year 2002: 8,831
- Year 2003: 8,413
- Year 2004: 8,020
- Year 2005: 9,459
- Year 2006: 13,009
- Year 2007: 14,179

Graph showing the linear increase over the years with a trend line indicating the growth.
Average Surgical TAT
(spec. registration to sign out)

- **Base Condition:**
  - Group Average = 44.5 Hours
    - Range - 23 to 104 hours
    - Time reflects all cases average

- Specimens accessioned upon arrival on day 1. Processed overnight

- Techs start at 0400 to embed, cut and stain, coverslip on day 2. Usually only 1 or 2 remain after 12:30 PM
CURRENT STATE
Equipment Selection

- Sakura Express Rapid Processor
  - 1 and 2 hour protocols in use
- Sakura VIP Conventional Processors
  - Overnight processing for selected tissues
- Conventional Embedding Centers
- Ventana Symphony H&E Stainer
  - Issues with reliability
- Sakura Linear Stainer - backup became primary
Product/Operator Flow

- Cases are processed singly through the grossing step.
- Processed in small batches on the Sakura Express.
- Embedded, Cut and mounted in single case flow to reduce errors.
- Final step is block check to ensure quality and error detection.
- Product Flow is now unidirectional.
Post Lean Workflow
Unique/Innovative Features

- Hazardous Solvent Disposal System
  - Waste from recyclers placed down a dedicated sink to a solvent collection center for removal.

- Recycling Layouts
  - Recycling of Alcohol and Xylene

- IHC/FISH Layout
  - Self supporting section – offers >100 markers

- Transcription
  - Home based transcription - EMR
Post Lean Performance Improvement

- Redistributed Staffing Matrix
  - 2 Lab Technical Assistants for Gross Assistance as well as other support duties.
  - Histology Technical Staff does technical duties plus bone marrow/FNA slide preparation – quality step.
  - Slides/histotech increased to >14,000 per year
Post Lean Improvements (cont).

- Linear workflow means markedly reduced walking and time waste.

- Block Check/Quality Check means less re-work and higher quality.

- In excess of 65% of all specimens are processed using rapid processing.
Current Pathology Turn Around Times

- **Current Condition (as of 6/08)**
  - Group Average = 27.3 Hours
    - Range - 6 to 48.5 hours

  Receipt into Histology to Sign-Out by Pathologist
  Time reflects all cases average
  Selected cases available same day as received
Summary

- Lean design improved workflow
- Lean plus Automation allowed for greater productivity with less stress.
- Lean design improved total Pathology Turn Around Time.
- Staff satisfaction is at its historical highest.
  - Both technical staff as well as Medical Staff.
Pearls of Pathology

- Improve processes THEN automate.
- Use improved processes to design area.
- No need to have pathologists read at night if no action is to be taken until morning.
- Look at TOTAL processes not just technical processes.
- Applying Lean Principles takes patience
Questions??

Thank You!!